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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/057,506	01/23/2002	Stephen T. Wellinghoff	SWRI-2835-03	4321
23770	7590	01/12/2004	EXAMINER	
PAULA D. MORRIS & ASSOCIATES, P.C. 10260 WESTHEIMER, SUITE 360 HOUSTON, TX 77042			SADULA, JENNIFER R	
			ART UNIT	PAPER NUMBER
			1756	

DATE MAILED: 01/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/057,506

Applicant(s)

WELLINGHOFF ET AL.

Examiner

Jennifer R. Sadula

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply is specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/23/2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) 35-54 and 64-75 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-34 and 55-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) see attach.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: See Continuation Sheet.

Continuation of Attachment(s) 6). Other: IDS: 4/19/02, 7/25/02, 8/1/02, 10/31/02, 1/30/03, 4/4/03.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-34 and 55-63, drawn to a blend or method of making a blend having the platform molecular structure as specified, classified in class 252, subclass 299.64.
- II. Claims 35-53 and 64-69, drawn to a method of making polymerizable mesogens having the characteristics as specified, classified in class 523, subclass 109.
- III. Claims 53-54 and 70-75, drawn to a composition or method of making a material, classified in class 526, subclass 72.

The inventions are distinct, each from the other because of the following reasons:

Inventions I, II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are neither disclosed as capable of being utilized together, each having different modes of operation and function and clearly producing compounds expressing different effects. More specifically, invention I has compounds containing platform molecules as specified. They are not necessarily made of the precursors from inventive groups II and III. Likewise, the inventive group III is to produce a polymerization shrinkage of about 3 vol% change or less however these materials may not have curing temperatures sufficiently low to avoid discomfort during dental procedures. Therefore these inventions are unrelated.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper. Furthermore, the search required for Group I is not required for Group II or III, thus making restriction for examination purposes as indicated proper. Likewise, the search required for Group II is not required for Group III, again making restriction proper.

During a telephone conversation with Paula Morris on 5 December 2003 a provisional election was made with traverse to prosecute the invention of group I, claims 1-34 and 55-63. Affirmation of this election must be made by applicant in replying to this Office action. Claims 35-54 and 64-75 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Information Disclosure Statement

The IDS's filed 4/19/2002, 8/1/2002, 10/31/2002, 1/30/2003 and 4/4/03 have been considered in their entirety.

Examiner notes that 9th reference on page 3 of the IDS filed 4/19/2002 is a duplication of a reference on a later filed IDS and thus is noted as considered on the later filed IDS. Furthermore, the first non-patent document listed on page 1 and the last non-patent document listed on page 2 of the IDS do not have a date associated therewith. The only non-patent listing on page 5 does not contain any citation information other than title. Upon resubmission appropriate correction is required.

Specification

The abstract of the disclosure is objected to because it fails to adequately describe the scope of the invention. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details. The language should be clear and concise and should not repeat information given in the title. Correction is required. See MPEP § 608.01(b).

Claim Objections

Claim 30 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claim 30, which depends from claim 21, is an exact duplicate of claim 21. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites X and Y being "independently selected from the groups consisting of terminal functionalities and spacer groups". Claims 2-4 each recite I to comprise a "terminal functionality" and Y to comprise, "a polymerizable group". Examiner notes that a polymerizable

group in neither a terminal functionality or a spacer group- as evidence by Applicants' claims 55-57. Although these groups are "substituted by polymerizable group"- it is unclear in claims 2-4 if Applicants further intend for X and Y to comprise such groups pre-substitution or post. Appropriate correction is therefore required.

Double Patenting

Claims 1-34 and 55-63 of this application conflict with claims 1-18, 24-35, 39-107 of Application No. 10/056,121 which was allowed on 7/28/2003. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

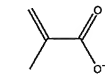
Claims 1-34 and 55-63 are rejected under 35 U.S.C. 102(e) as being anticipated by Seiberle et al., U.S. Patent No. 6,649,230 ("Seiberle").

Applicant claims a blend comprising randomly substituted mesogens and methods for producing such blends comprising the polymerizable platform molecules as specified.

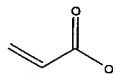
Examiner wishes to be by stating that although Applicants' limit R^1 and R^3 to be selected from "groups less bulky than R^2 " it is clear to the Examiner that H groups are "less bulky" than any organic group R^2 could comprise and therefore such limitation was searched.

With regard to Applicants' claims 1 and 55, Seiberle teaches photoactive polymers of the general formula I wherein the combination of S^5 -M (the pendant moiety off of aromatic group B) consists of a "bulky organic group". The rings E and D (when n^1 and $n^2=0$) may each be phenyl rings as shown in the examples (see column 22, example 1 and mon 1 in columns 35-36). Applicants' R^1 and R^3 are both either H or may further be F, Cl, CN, or cyclic, straight-chain or branched alkyl residue which is further substituted or unsubstituted (6:9-24). The P-S¹ group of Seiberle anticipates Applicants' Y-group consisting of a terminal functionality and a spacer group. The R^1 of Seiberle anticipates Applicants' X- group wherein the R^1 group may or may not be polymerizable (6:42-53). With regard to Applicants' claims 2-4 (and subsequently claims 56-57), as it is preferred by Seiberle to have only one polymerizable terminal unit, clearly this anticipates when 50%, 60% or even 70% of the blended material has X as a terminal functionality and Y as a polymerizable functionality.

With regard to Applicants' claims 5-16 and subsequently claims 58-62, Seiberle teaches that the preferred polymerizable groups are those of general formula II or III (column 7) are methacrylates or acryloyloxy groups as each group is (in respective order):



methacrylate



acryloyloxy

thereby satisfying the limitations of these claims.

With regard to Applicants' claims 17-30 and 63, Seiberle teaches the terminal functionalities of the R^1 group to include straight and branched chain alkyl residues where are substituted or unsubstituted as specified having C_1 - C_{12} atoms (11:29-46), thereby anticipating hydroxyl groups as C_1 , when substituted with an O group becomes a hydroxyl group and anything higher than C_1 (ie C_2 - C_{12}) anticipates an alkoxy group or spacer group depending on if it is substituted or not.

With regard to Applicants' claims 31-34, Examiner notes that the term "room temperature" defines approximately 21-23°C. Seiberle teaches that the materials in the examples are prepared at room temperature and then the reaction mixture is partitioned between dichloromethane and water; the organic phase washed repeatedly with water, dried over sodium sulfate, filtered and concentrated by rotary evaporation. This satisfies the Applicants' limitation that the curing temperature T_c be from "about 20°C to about 37°C".

Claims 1, 5, 8, 11, 14, 31, 33 and 55-62 are rejected under 35 U.S.C. 102(b) as being anticipated by Schadt et al., U.S. Patent No. 6,144,428 ("Schadt").

Schadt teaches an optical component comprising a hybrid layer formed from an orienting layer and a layer of cross-linked liquid crystalline monomer (abstract) wherein the liquid crystalline monomers are diacrylate components as shown in columns 3-6. Therefore, Schadt teaches, in accordance with Applicants' claimed invention, a blended material wherein one or more platform molecules having the expressed terminal substituents as shown (representing

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Applicants' X and Y) corresponds to Applicants' general structure wherein Applicants' R^1 and R^3 are "groups less bulky than R^2 " as it is clear to the Examiner that H groups are "less bulky" than any organic group R^2 (the substituent on the central ring) could be. However in each of Mon1, Mon2 and Mon3 of Schadt the substituents on the central ring are more substantial than the H-substitutions on the two outer rings- however this is most prevalent in Mon1.

With regard to Applicants claims 56-57 it is clear that the blend comprises more polymerizable monomers of the Applicants' composition formula 1 than non-polymerizable.

With regard to Applicants' claims 5, 8, 11, 14 and 58-62, Schadt teaches that the preferred polymerizable groups are as shown in the monomers of column 3-6 wherein the polymerizable groups are acryloyloxy groups (as defined and shown above), or more specifically acryloyloxy alkoxy groups, thereby satisfying the limitations of these claims.

With regard to Applicants' claims 31 and 33, Examiner notes that the term "room temperature" defines approximately 21-23°C. Schadt teaches that these components were used to develop a super-coolable nematic mixture having a particularly low melting point so that the LCP layer could be prepared at room temperature (5:10-15). This satisfies the Applicants' limitation that the curing temperature T_c be from "about 20°C to about 37°C".

Claims 1-34 and 55-63 are rejected under 35 U.S.C. 102(b) as being anticipated by Jolliffe et al., U.S. Patent No. 6,117,920 ("Jolliffe").

Jolliffe teaches a thermochromic polymerizable mesogenic composition comprising components MA and MB (2:61-65) wherein the polymerizable components MA are selected

from formula I $P-(Sp-X)_n-MG-R$ wherein R may be $P-(Sp-X)_n$ thereby granting the option that either one or both ends of the component be polymerizable. MG is defined in column 5 as $A^1-Z^1-A^1-Z^1-A^2-$ which is preferably, as shown in the table in column 6, as a three-ring mesogenic group such as $-Phe-Z^1-PheL-Z^1-Phe-$; $-PheL-Z^1-PheL-Z^1-PheL-$; $-Phe-Z^1-PheL-Z^1-PheL-$; or $-PheL-Z^1-PheL-Z^1-Phe-$. With regard to Applicants' claims 1 and 55, either option anticipates Applicants' three-ring mesogenic groups as L- the substituent group dangling off of either phenyl group (particularly central)- is halogen, cyano, nitro, C_1-C_7 alkyl, C_1-C_7 alkoxy or C_1-C_7 alkanoyl where one or more H atoms may be substituted by F or Cl (5:18-28). C_7 compounds indeed provide for anticipation of Applicants' "bulky organic group".

With regard to Applicants' claims 2-4 (and subsequently claims 56-57), as it is preferred by Jolliffe to have at least one polymerizable terminal unit, clearly this anticipates when 50%, 60% or even 70% of the blended material has X as a terminal functionality and Y as a polymerizable functionality.

With regard to Applicants' claims 5-16 and subsequently claims 58-62, Jolliffe teaches that the preferred polymerizable groups are vinyl, acrylate, methacrylate, propenyl ether or epoxies (4:65-67) thereby satisfying the limitations of these claims. Preferably, as noted in that passage, the groups are acrylates or methacrylates.

With regard to Applicants' claims 17-30 and 63, Jolliffe teaches that when the R group is not polymerizable it is an alkyl radical with up to C_{25} which may be substituted or unsubstituted and may be a sulfur containing, amino, sulfahydryl, halogen or the like (3:40-51) thereby anticipating these claims.

With regard to Applicants' claims 31-34, Examiner notes that the term "room temperature" defines approximately 21-23°C. Jolliffe teaches that the materials be given short bursts of UV light at different temperatures in order to cure the materials. Some of the polymer cures at "room temperature", 25°C, 30°C and 35°C (26:31-46) thereby satisfying the limitations of these claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references each teach Applicants' polymerizable mesogenic units as specified:

- A. Verrall et al and Parri et al. each teach where the substituent on the central phenyl ring is C₁-C₇.
- B. Coates et al '461 teaches where the substituent on the central phenyl ring is C₁-C₆.
- C. Broer et al teaches where the substituent on the central phenyl ring is C₁-C₆ but is cured at what appears to be too high of a temperature.
- D. Coates et al '092 and Coates et al. '955 each teach where the substituent on the central phenyl ring is C₁-C₄.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

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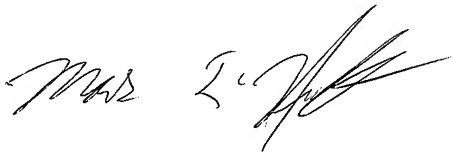
application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer R. Sadula whose telephone number is 571.272.1391.

The examiner can normally be reached on Monday through Friday, 10am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571.272.1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

A handwritten signature in black ink, appearing to read "Mark F. Huff", with a stylized flourish at the end.

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

JRS
15 December 2003